U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

2.2.1 - 2.2.2 IDENTIFICATION OF POTENTIAL HAZARDS IN SITE VICINITY

REVIEW RESPONSIBILITIES

Primary -~~Siting Analysis Branch (SAB)~~ Probabilistic Safety Assessment Branch (SPSB)

Secondary -None

I. AREAS OF REVIEW

For an early site permit application, the ~~The~~ site and its vicinity are reviewed for relative location and separation distance with respect to industrial, military, and transportation facilities and routes. Such facilities and routes include air, ground, and water traffic, pipelines, and fixed manufacturing, processing, and storage facilities. The review focuses on potential external hazards or hazardous materials that are present or which may reasonably be expected to be present during the projected lifetime of a nuclear power plant or plants of specified type that might be constructed on the proposed site ~~the proposed plant~~. The purpose of this review is to establish the

information concerning the presence and magnitude of potential external hazards so that the reviews and evaluations described in SRP Sections 2.2.3~~, 3.5.1.5,~~ and 3.5.1.6 can be performed.

~~Control room habitability with respect to toxic chemicals is reviewed in SRP Section 6.4 by the Accident Evaluation Branch (AEB) as part of its primary review responsibility.~~

II. ACCEPTANCE CRITERIA

10 CFR 52.24 requires that an early site permit application meet the applicable standards and requirements of the Atomic Energy Act and the Commission regulations. With respect to site hazards, 10 CFR ~~Part 100 §~~100.~~10~~20 requires that site acceptance be based on, among other considerations, ~~the consideration of factors relating to the proposed reactor design and the characteristics peculiar to the site. One of the factors involves~~ the use characteristics of the site environs. In accordance with 10 CFR ~~Part 50. §50.34~~ 52.17, the ~~applicant~~ application is required to contain ~~submit in the preliminary and final safety analysis reports (PSAR and FSAR)~~ information needed for evaluating these factors. Guidelines for specific information requirements are described in Chapter 2, Sections 2.2.1 and 2.2.2 of Regulatory Guide (RG) 1.70.

The information submitted by the applicant is adequate and meets the 10 CFR ~~Part 50, §50.34~~ 52.17 and 10 CFR ~~100, §~~100.~~10~~20 requirements and RG 1.70 guidelines if it satisfies the following criteria.

1. Data in the site safety assessment ~~safety analysis report (SAR)~~ adequately describe the locations and distances of industrial, military, and transportation facilities in the vicinity of a ~~the~~ nuclear power plant or plants of specified type that might be constructed on the proposed site, and is in agreement with data obtained from other sources, when available.

2. Descriptions of the nature and extent of activities conducted at the site and nearby facilities, including the products and materials likely to be processed, stored, used, or transported, are adequate to permit identification of possible hazards in subsection III of this SRP section.

3. Sufficient statistical data with respect to hazardous materials are provided to establish a basis for evaluating the potential hazard to a nuclear power plant or plants of specified type that might be constructed on the proposed site ~~the plant~~.

III. REVIEW PROCEDURES

Selection and emphasis of various aspects of the areas covered by this review plan will be made by the reviewer on each case. The judgment of the areas to be given attention during the review is to be based on an inspection of the material presented, the similarity of the material to that recently reviewed for other sites ~~on other plants~~, and whether items of special safety significance are involved. The following procedures are followed:

1. The reviewer should be especially alert, in the ~~construction permit (CP)~~ early site permit ~~stage~~ review, for any potentially hazardous activities in close proximity ~~of~~ to the site~~plant~~, since the variety of activities having damage potential at ranges under about 1 kilometer can be very extensive. All identified facilities and activities within 8 kilometers (5 miles) of the plant site should be reviewed. Facilities and activities at greater distances should be considered if they otherwise have the potential for affecting ~~plant~~ safety-related features of a nuclear power plant or plants of specified type that might be constructed on the proposed site. ~~At the operating license (OL) stage,~~ For sites with existing plants, most hazards will already have been identified. Emphasis should be placed on any new information. ~~At the operating license stage~~ For such sites, any existing analyses pertaining to potential accidents involving hazardous materials or activities on or in the vicinity of the ~~plant~~ site will be reviewed to ensure that results are appropriate in light of any new data or experience which is ~~then~~ available at the time of review. Facilities which are likely to either produce or consume hazardous materials should be investigated as possible sources of traffic of hazardous materials past the site.

2. Information should be obtained from sources other than the ~~SAR~~ safety assessment wherever available, and should be used to check the accuracy and completeness of the information submitted in the ~~SAR~~ safety assessment. This independent information may be obtained from sources such as U.S.

Geological Survey (USGS) maps and aerial photos, published documents, contacts with State and Federal agencies, and from other **early site permit or** nuclear plant applications (especially if they are located in the same general area or on the same waterway). Information should also be obtained during the site visit and subsequent discussions with local officials. (See Standard Review Plan Section 2.1.1 for further guidance with regard to site visits.) To the extent that definitive information is available, future potential hazards over **a time period that includes** the proposed life of **a nuclear power plant or plants of specified type that might be constructed on the proposed site (plus the term of the early site permit)** ~~the plant~~ should be reviewed.

3. The specific information relating to types of potentially hazardous material, including distance, quantity, and frequency of shipment, is reviewed to eliminate as many of the potential accident situations as possible by inspection, based on past review experience. **For sites with existing plants,** ~~At the operating license stage~~, nearby industrial, military, and transportation facilities and transportation routes will be reviewed for any changes or additions which may affect the safe operation of ~~the~~ **a nuclear power** plant **or plants of specified type that might be constructed on the proposed site**. If these changes alter the data or assumptions used in previous hazards evaluations or demonstrate the need for new ones, appropriate evaluations will be performed.

Although detailed plant design information may not be available for the ESP review, the following specific references may provide useful guidance in the review of potential releases of hazardous materials. For pipeline hazards, Reference 7 may be used as an example of an acceptable risk assessment. For cryogenic fuels, Reference 9 may be used, and for tank barge risks, Reference 8. For military aviation, Reference 10 may be used. Safe separation distances for explosives are identified in References 1 and 2, and for toxic chemicals, Reference~~s~~ 3 ~~and 4~~ should be consulted.

The distance from nearby railroad lines is checked to determine if ~~the plant~~ **a nuclear power plant or plants of specified type that might be constructed on the proposed**

site is within the range of a "rocketing" tank car which, from Reference 5, is taken to be 350 meters with the range for smaller pieces extending to 500 meters.

If a nuclear power plant or plants to be sited involves bulk storage of hazardous materials, e.g. liquid or compressed hydrogen or oxygen, the associated hazards will have to be addressed once this design information is identified (at the combined license stage if not available at the early site permit stage). Reference 13 may be used for guidance to assess hazards associated with the storage and use of these materials.

4. Potential accidents which cannot be eliminated from consideration as design basis events because the consequences of the accidents, if they should occur, could be serious enough to affect ~~plant~~ safety-related features of a nuclear power plant or plants of specified type that might be constructed on the proposed site, are identified. Potential accidents so identified ~~are assessed in detail, using criteria in Standard Review Plan SRP Sections 2.2.3, 3.5.1.5, or 3.5.1.6, as appropriate.~~ will have to be addressed at the combined license stage if sufficient design detail information is not available at the early site permit stage.

IV. EVALUATION FINDINGS

The reviewer verifies that the information submitted by the applicant is in accordance with 10 CFR ~~Part 50, §~~50.34 requirements and within RG 1.70 guidelines such that compliance with 10 CFR Part 100~~, §100.10~~ can be evaluated. The information is sufficiently complete and adequate if it can support conclusions of the following type, to be used in the staff's ESP safety evaluation report:

~~The~~ As set forth above, the applicant has provided information in the ~~SAR~~safety assessment on potential site hazards in accordance with the requirements of 10 CFR ~~50, §50.34~~ 52.17 and the guidance of Regulatory Guide 1.70. The nature and extent of activities involving potentially hazardous materials which are conducted at nearby industrial, military, and transportation facilities have been evaluated to identify any such activities which have

the potential for adversely affecting ~~plant~~ safety-related structures of a nuclear power plant or plants of specified type that might be constructed on the proposed site. Therefore, based ~~Based~~ on evaluation of information contained in the ~~SAR~~safety assessment, as well as information independently obtained by the staff, ~~it is concluded~~ the staff concludes that all potentially hazardous activities on and in the vicinity of the~~ plant~~ site have been identified. The hazards associated with these activities have been reviewed and are discussed in Sections _____ and _____ of this SER.

~~If the activities are identified as being potentially hazardous, the evaluations described in Standard Review Plan SRP Sections 2.2.3, 3.5.1.5, and 3.5.1.6 are performed with respect to the inherent capability of the plant or special plant design measures to prevent radiological releases in excess of the 10 CFR Part 100 guidelines.~~ If the activities are identified as being potentially hazardous, the evaluations are performed using applicable review guidance. For example, in most cases aircraft hazards may be evaluated at the early site permit stage using SRP sections 2.2.3 and 3.5.1.6. In the event the identified hazards (including aircraft hazards) cannot be addressed at the early site permit stage due to the unavailability of plant design information, they will be evaluated at the combined license stage.

V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plans for using this SRP section.

This SRP section will be used by the staff when performing safety evaluations of early site permit applications submitted by applicants pursuant to 10 CFR Part 52. Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations.

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced regulatory guides and NUREG.

VI. REFERENCES

1. Department of the Army Technical Manual TM5-1300, "Structures to Resist the Effects of Accidental Explosions," June 1969.

2. Regulatory Guide 1.91, "Evaluation of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plant Sites."

3. ~~Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release."~~ Draft Regulatory Guide DG-1087, "Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Chemical Release."

~~4. Regulatory Guide 1.95, "Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release."~~

5. National Transportation Safety Board Railroad Accident Report, "Southern Railway Company, Train 154, Derailment with Fire and Explosion, Laurel, Mississippi, January 25, 1969," October 6, 1969.

6. Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants."

7. NUREG-0014 Safety Evaluation Report, Hartsville Nuclear Plants A1, A2, B1, and B2, April 1976, Docket STN 50-518.

8. Safety Evaluation of the Beaver Valley Power Station, Unit No. 2, November 9, 1976 and supplements. Docket 50-412.

9. Safety Evaluation Report, Hope Creek Generating Station, Units 1 and 2, Supplement No. 5, March 1976, Docket 50-354 and 50-355.

10. Project 485, Aircraft Considerations, Preapplication Site Review, Boardman Nuclear Plant. October 1973.

11. ~~10 CFR Part 50, §50.34, "Contents of Applications: Technical Information."~~10 CFR Part 52, "Early Site Permits; Standard

Design Certifications; and Combined Licenses for Nuclear Power Plants."

12. 10 CFR Part 100, ~~§100.10. "Factors to Be Considered When Evaluating Sites~~ Reactor Site Criteria."

13. NRC Staff Safety Evaluation Report (July 1987) contained in Electric Power Research Institute (EPRI) Report NP-5283-SR-A. "Guidelines for Permanent BWR Hydrogen Water Chemistry Installation - 1987 Revision."